

Title (en)  
METHOD AND APPARATUS FOR DETERMINING THE HEALTH AND REMAINING SERVICE LIFE OF AUSTENITIC STEEL REFORMER TUBES AND THE LIKE

Title (de)  
VERFAHREN UND VORRICHTUNG ZUR BESTIMMUNG DER INTEGRITÄT UND DER VERBLEIBENDEN LEBENSDAUER EINER REFORMERRÖHRE AUS AUSTENITISCHEM STAHL UND DERGLEICHEN

Title (fr)  
PROCÉDÉ ET APPAREIL DE DÉTERMINATION DE LA SANTÉ ET DE LA DURÉE DE VIE RESTANTE DE TUBES REFORMEURS EN ACIER AUSTÉNITIQUE ET AUTRES

Publication  
**EP 2929342 A4 20160720 (EN)**

Application  
**EP 13861778 A 20131210**

Priority  
• US 201261735505 P 20121210  
• US 2013074216 W 20131210

Abstract (en)  
[origin: WO2014093404A2] Testing methods and apparatus for testing the health of steel tubes used in reformers and other tubes and pipes used in other high temperature applications. The method includes the steps of transmitting two sinusoidal electromagnetic signals, each having a different frequency F1 and F2, into the reformer tube, receiving a response signal, and analyzing the received response signal's intermodulation frequencies to determine the state of the steel reformer tube.

IPC 8 full level  
**G01N 27/82** (2006.01); **G01N 27/90** (2006.01)

CPC (source: EP KR RU US)  
**G01N 27/82** (2013.01 - KR RU US); **G01N 27/83** (2013.01 - EP KR US); **G01N 27/9046** (2013.01 - US)

Citation (search report)  
• [A] GB 2088064 A 19820603 - GROTEWOHL BOEHLLEN VEB  
• [A] US 5180969 A 19930119 - KWUN HEGEON [US], et al  
• [A] US 6275050 B1 20010814 - BORN FRANK H [US], et al  
• [A] US 6201391 B1 20010313 - BURKHARDT GARY L [US], et al  
• [A] US 2006119492 A1 20060608 - KIM BYUNG-KI [KR]  
• [A] US 5616850 A 19970401 - SAGE GERALD F [US]  
• See references of WO 2014093404A2

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**WO 2014093404 A2 20140619; WO 2014093404 A3 20140807**; BR 112015013573 A2 20170711; BR 112015013573 B1 20201103; CA 2893330 A1 20140619; CA 2893330 C 20200310; EP 2929342 A2 20151014; EP 2929342 A4 20160720; EP 2929342 B1 20191106; ES 2765182 T3 20200608; HU E047605 T2 20200528; JP 2016506502 A 20160303; JP 2018189656 A 20181129; JP 6545872 B2 20190717; KR 101732347 B1 20170504; KR 102145654 B1 20200819; KR 20150093234 A 20150817; KR 20160128436 A 20161107; MX 2015007368 A 20160331; MX 347147 B 20170417; MY 175114 A 20200608; PL 2929342 T3 20200518; RU 2602731 C1 20161120; SA 515360550 B1 20170926; US 10060882 B2 20180828; US 2015300989 A1 20151022; US 2016195496 A1 20160707; US 9546982 B2 20170117; US RE48734 E 20210914

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